

APPARATUS AND METHODS FOR INTEGRALLY PACKAGING  
OPTOELECTRONIC DEVICES, IC CHIPS AND  
OPTICAL TRANSMISSION LINES

Abstract of the Disclosure

5           Apparatus and methods for packaging optical communication devices include optical bench structures, such as silicon-optical benches (SiOB). An optical communications apparatus includes an optical bench comprising a substrate having an electrical turning via formed therein. An optoelectronic (OE) chip and integrated circuit (IC) chip are mounted on the optical bench and electrically connected using the electrical turning via. The electrical turning via extends in directions both perpendicular and transverse to a surface of the substrate such that the OE chip and IC chip can be mounted on perpendicular surfaces of the optical bench in close proximity and electrically connected using the electrical turning via. More specifically, the OE chip and IC chip are mounted on the optical bench such that a light-emitting or 10 light-detecting surface of the OE chip is substantially perpendicular to a surface of the IC chip having contacts, and such that optical transmission lines that are mounted parallel to the substrate surface can be directly coupled to 15 the OE chip. 20